
UBIQ Aerospace
Creating Tech That matter

Kim Lynge Sorensen

Founder and CEO of UBIQ Aerospace

In-flight icing for low-Reynolds number aircraft

Part of the Advanced Modeling & Simulation Seminar Series

NASA Ames Research Center, November 7, 2019

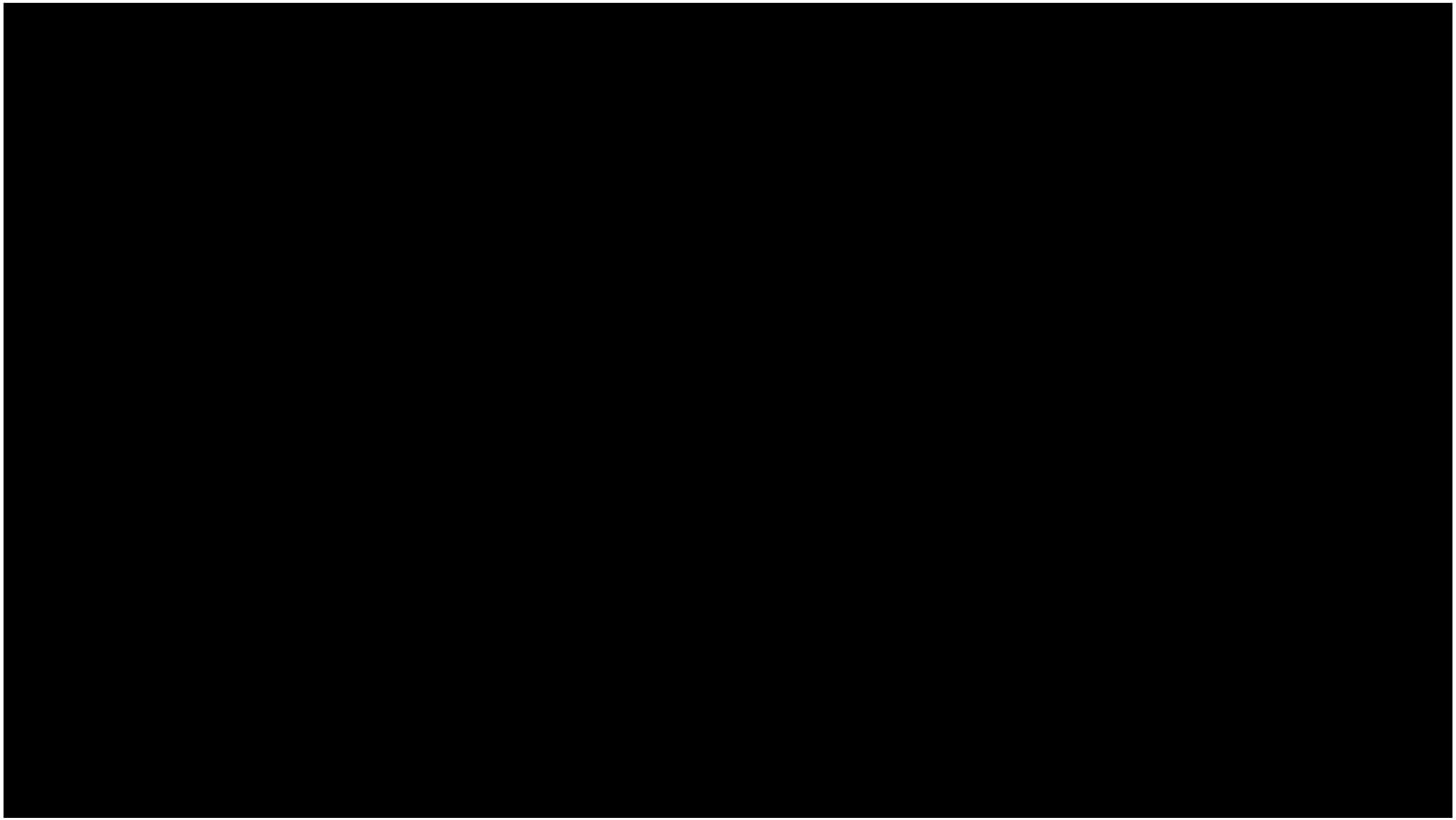
Agenda

- My background
- In-flight icing
- The D•ICE story
- UBIQ Aerospace
- Solving in-flight icing in its entirety

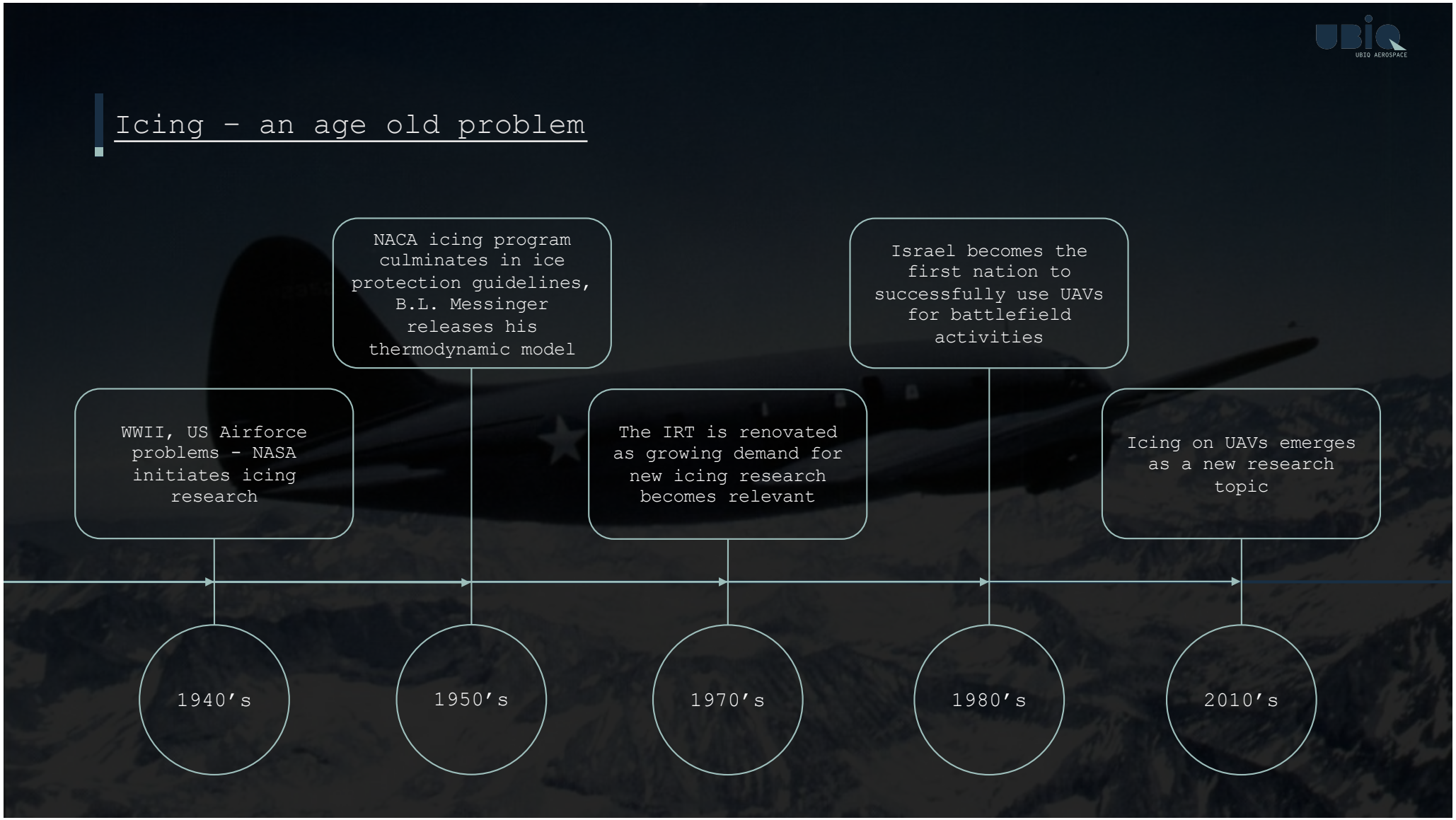
My background

- I grew up in Copenhagen, Denmark
- Living in Trondheim, Norway
- MSc. in Robotics from DTU and Stanford
- Ph.D. in Cybernetics from NTNU AMOS
- Visiting Researcher at NASA Ames
- Post Doctoral Fellow at NTNU AMOS
- Co-founder and CEO of UBIQ Aerospace


In-flight icing



Icing – an age old problem



A highly complex problem

In-flight icing affects

- Leading edge of wings and stabilizers
  Up to **90% added drag** and an **80% reduction in lift**

- Airspeed sensors – pitot-tubes
  Faulty airspeed measurements can cause **autopilot misinterpretation** leading to **fatal maneuvers**

- Propellers
  Ice builds on the leading edge, critically **diminishing thrust, engine efficiency**, and **power consumption**

Conventional solutions

Mechanical

Electro-thermal

Chemical

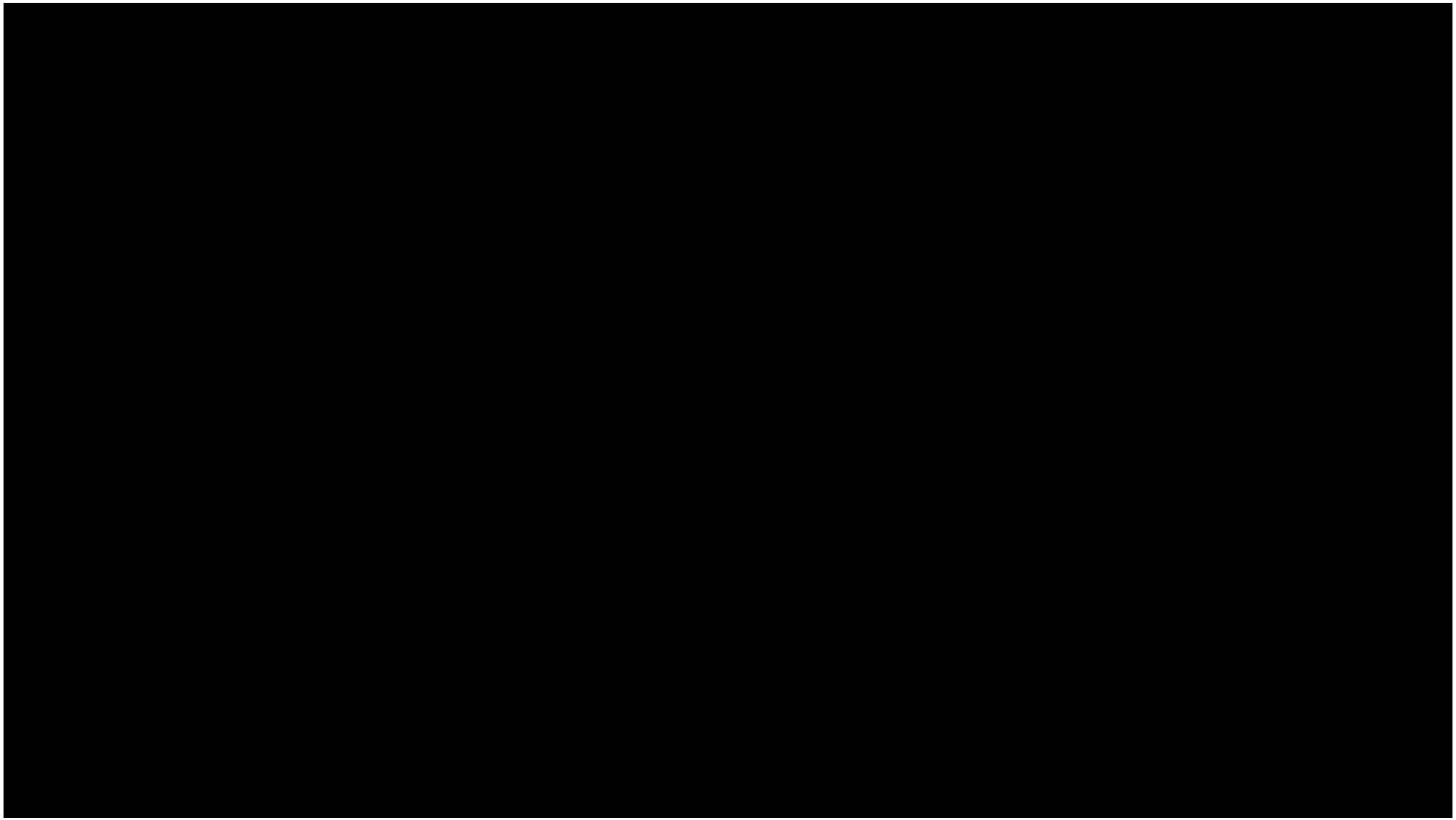
Heavy

Environmentally hazardous

Power In-efficient

Structurally invasive

All require human interaction



The D•ICE product

The world's first autonomous in-flight icing protection solution.

Sensor package monitoring flight conditions.

Intelligent algorithms for optimized icing detection and mitigation.

Control units for data collection, data processing, and energy allocation.

Retro-fit or embedded electro-thermal panels, easily installable.

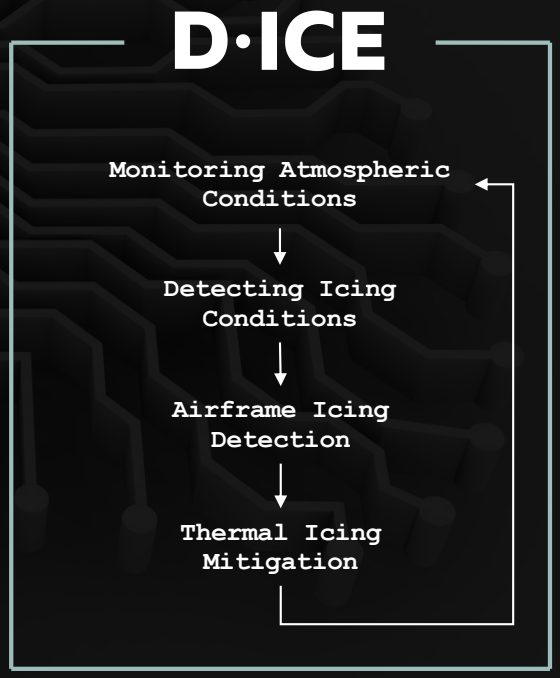
The D•ICE technology

Intelligent in-flight icing detection and mitigation algorithms

Autonomously manages potential icing hazards

No human interaction required

Operators and pilots can focus on achieving operational goals



The D•ICE story

NTNU

May 2013 — Project Start

NASA Collaboration — Sep 2014 - …

Apr 2015 — World's first D•ICE flight

Icing Wind Tunnel Experiments — Feb 2016

May 2017 — Next Generation D•ICE Prototype Flights

UBIQ Aerospace Established — Nov 2017

May 2018 — D•ICE Launched at the Xponential

Pilot Project w. Customer, Established — Sep 2018

May 2019 — Icing Wind tunnel Experiments

Seed Funding Round — Jun 2019

NOW

D·ICE

UBIQ Aerospace - Team

- Founding partner of UBIQ Aerospace
- Co-inventor of the D•ICE technology
- MSc. in robotics from DTU and Stanford
- PhD in Aerospace Cybernetics from NTNU

Kasper T. Borup
CTO

- Founding partner of UBIQ Aerospace
- Main inventor of the D•ICE technology
- MSc. in robotics from DTU and Stanford
- PhD in Aerospace Cybernetics from NTNU

Kim L. Sørensen
CEO

- Former engineering scientist at Aptomar
- MSc. in Engineering Cybernetics from NTNU
- PhD in Marine Cybernetics from NTNU

Bård N. Stovner
Lead Scientist

- Former founder and CTO of SeaRo
- Former engineering scientist at Atlas Meridan
- MSc. in robotics from DTU
- PhD in Marine Cybernetics from NTNU

Mikkel C. Nielsen
Lead Engineer

- Former project manager at Equinor
- MSc. in Mechanical & Aerospace Engineering from the University of Stuttgart
- PhD candidate Aerospace Analysis at NTNU

Richard Hann
System Analyst

- Former engineering scientist at Honeywell
- MSc. in Control Engineering and Robotics from Wroclaw University of Technology
- PhD in Embedded Systems Design from NTNU

Artur P. Zolich
System Developer

UBIQ Aerospace – Advisors and Board

Professor Tor Arne Johansen, Director of the Board & Tech. Advisor

Founding partner of UBIQ Aerospace • Co-inventor of the D•ICE technology • World renowned research scientist within autonomy and unmanned aircraft technology • Founding partner of Marine Cybernetics and Scout Drone Inspection.

Kristin Jørstad, President of the Board of Directors & IP Advisor

Innovations manager at NTNU Technology Transfer • 10 years practise within Corporate Law • 10 years experience in technology transfer.

Ben FitzGerald, Director of the Board & Business Advisor

Partner at Lupa Systems • Adjunct senior fellow at CNAS • Served as Executive Director – Strategy, Data, and Design in Pentagon • Served as a professional staff member on the US Senate Armed Services Committee.

Haakon Skar, Business Advisor

CEO of NTNU Accel • Founding partner and CEO of T:Lab • Director of Marketing, MCU Tools and Software at Atmel • Sales and Marketing Director at SCP.

Solving in-flight icing

D•ICE_Airframe for all aerodynamic surfaces

D•ICE_Propellers for all multicopters, helicopters and other propeller-driven UAS

D•ICE_Airspeed supplying valuable measurements in any conditions

D•ICE_Planning a path planning tool to optimize operational outcome

For more information, please visit our website

www.ubiqaerospace.com